

Cal/Ecotox

Exposure Factors for Pallid Bat (*Antrozous pallidus*)*

Page 1

Endpoint Type	Endpoint Value	Error	Range	Units	Sex	Life Stage	Location	Note	Reference
Age at Fledging, Metamorphosis, Weaning	7-10			wks	B	Juvenile	Lab	a	1
Age at Sexual Maturity	>1			yr	M	Adult	AZ	b	2
Age at Sexual Maturity	1			yr	F	Yearling	AZ	c	2
Body Weight - Mean	39.2	2.6 SE		g	F	Adult	Lab	d	3
Body Weight - Mean	36.0	1.9 SE		g	F	Adult	Lab	e	3
Body Weight - Mean	21.7	2.03 SD		g	F	Adult	OR	f	4
Body Weight - Mean	25.3		22.3-30.5	g	F	Adult	Lab	g	5
Body Weight - Mean	34.7			g	F	Adult	Kern; San Luis Obispo; CA	h	6
Body Weight - Mean	24.3			g	F	Adult	Kern; San Luis Obispo; CA	i	6
Body Weight - Mean	21.7	0.2 SE		g	M	Adult	Napa; CA	j	3
Body Weight - Mean	32.6	0.9 SE		g	M	Adult	Napa; CA	k	3
Body Weight - Mean	23.0		19.9-27.3	g	M	Adult	Lab	l	5
Body Weight - Mean	25.2			g	M	Adult	Kern; San Luis Obispo; CA	m	6
Body Weight - Mean	20.6			g	M	Adult	Kern; San Luis Obispo; CA	n	6
Body Weight - Mean	33.1	0.9 SE		g	F	Juvenile	Lab	o	3
Body Weight - Mean	23.3		21.0-26.8	g	F	Juvenile	Lab	p	5
Body Weight - Mean	Review				B	NR		q	7
Clutch or Litter Size			1-2	#/litter	F	Adult	Napa; CA	r	8
Clutch or Litter Size	1.8		1-3	young	F	Adult	Kern; San Luis Obispo; CA	s	6
Clutch or Litter Size			1-2	pups	F	Adult	AZ	t	2
Clutch or Litter Size	Review				B	NR		u	9
Clutch or Litter Size	Review				B	NR		v	7
Dietary Composition	Lepidoptera (48%), Coleoptera (25%), Orthoptera (14%), Other (Neuroptera, Chilopoda, Hymenoptera, Isoptera, Arachnida, Diptera, Odonata, Perognathus flavus; 13%)			%	NR	Adult	MEXICO	w	10
Dietary Composition	Review				B	NR		x	9
Dietary Composition	Review				B	NR		y	7
Dietary Composition	Lepidoptera (22.2), Grylliidae or Tettigoniidae (11.1), unident. insects (38.9), unident. Coleoptera (1.7), Cercopidae and Cicadellidae (1.7), Mymeleontidae (8.9), Carabidae (11.1), unident. Orthoptera (4.4)			%	NR	NR	TX	z	11
Dietary Composition	Lepidoptera (20.0), unident. Orthoptera (60.0), unident. insects (20.0)			%	NR	NR	OR	aa	12
Duration of Incubation or Gestation	9			wks	F	Adult	Kern; San Luis Obispo; CA	ab	6

Exposure Factors for Pallid Bat (*Antrozous pallidus*)

Page 2

Endpoint Type	Endpoint Value	Error	Range	Units	Sex	Life Stage	Location	Note	Reference
Duration of Incubation or Gestation	Review				B	NR		ac	7
Food Ingestion Rate			3.5-4.7	g/d	B	Adult	Lab	ad	6
Food Ingestion Rate			4-12	g/mo	M	Adult	Lab	ae	13
Food Ingestion Rate	Review				B	NR		af	9
Foraging Distance	3			km	NR	Adult	MEXICO	ag	10
Growth Rate	2.569	$r^2=0.94$		%/d	B	Juvenile	Napa; CA	ah	8
Growth Rate	25			g/2-3 mo	B	Juvenile	Lab	ai	1
Growth Rate	11			g/7 wks	M	Juvenile	AZ	aj	2
Inhalation Rate	0-52			respirations /min	B	Adult	Lab	ak	6
Inhalation Rate	see citation				NR	Adult	Lab	al	14
Inhalation Rate			550-680	breaths/min	NR	Adult	Lab	am	15
Inhalation Rate			100-150	breaths/min	NR	Adult	Lab	an	15
Longevity	57			mo	NR	Adult	Lab	ao	16
Metabolic Rate	see citation				F	Adult	Napa; CA	ap	17
Metabolic Rate	0.47			ml O ₂ /g BW/hr	NR	Adult	Lab	aq	14
Metabolic Rate			0.78-5.0	ml O ₂ /g BW/hr	NR	Adult	Lab	ar	14
Metabolic Rate	see citation				NR	Adult	Lab	as	15
Metabolic Rate	see citation			ml O ₂ /g/hr	B	Both Adult and Juv.	Lab	at	5
Metabolic Rate	see citation				B	Juvenile	Napa; CA	au	17
Survival/ Mortality	Review				B	NR		av	9
Survival/ Mortality	Review				B	NR		aw	7
Time of Hatching or Parturition	late May through June				B	Adult	AZ	ax	18
Time of Hatching or Parturition	May 27-June 18				F	Adult	Napa; CA	ay	17
Time of Hatching or Parturition	June 17 (initiation)				F	Adult	OR	az	4
Time of Hatching or Parturition	mid-June				F	Adult	AZ	ba	2
Time of Hatching or Parturition	Review				B	NR		bb	9
Time of Hatching or Parturition	Review				B	NR		bc	7
Time of Mating/ Laying	late Oct.-Nov.				B	Adult	Kern; San Luis Obispo; CA	bd	6
Time of Migration or Dispersal	mid-Oct.				B	Both Adult and Juv.	Kern; San Luis Obispo; CA	be	6
Time of Migration or Dispersal	August				B	Juvenile	AZ	bf	18
Time of Migration or Dispersal	Review				B	NR		bg	9
Time of Molt	May-Aug.				B	Adult	Kern; San Luis Obispo; CA	bh	6
Time of Torpor or Hibernation	late Mar.-early Apr.				B	Adult	Kern; San Luis Obispo; CA	bi	6

Notes

- a age at weaning; N=20 bats
- b N=NR
- c N=NR
- d N=3; Apr-May; bats were collected in Napa county, CA

Exposure Factors for Pallid Bat (*Antrozous pallidus*)

Page 3

e N=6; August; bats were collected in Napa county, CA
f mean body weight for lactating females; N=39; Condition=breeding; Apr.-Jul.; John Day River Valley, 44deg 55' N, 120deg 27' W
g N=5
h N=10; Condition=late pregnancy; June
i N=15; Condition=ovulating; April
j N=135; Apr.-Sept.
k N=10; Oct., Dec.
l N=5
m N=16; June
n N=NR; N=2; April
o N=8; August; bats were collected in Napa county, CA
p N=5
q N=NR
r N=40 bats; Napa, CA
s N=28 bats
t N=50; 66% of observed females had twins
u N=NR
v N=NR
w percent occurrence in diet based on culled parts and scat analysis; N=150 bats; Condition=breeding; Jun-Aug; Hidalgo county
x N=NR
y N=NR
z percent volume of stomach contents; N=9; Jun.-Sept.; Big Bend National Park
aa Percent volume of stomach contents; N=5 bats
ab estimation based on observations in wild and captive bats; N=NR
ac N=NR
ad range of mean daily intake of mealworms by captive bats; N=3 bats
ae range of mean monthly rates of ingestion of mealworm diet, measured over three years; N=NR; bats collected in Napa, CA
af N=NR
ag max. distance travelled from roost during foraging; N=150 bats; Condition=breeding; Jun-Aug
ah slope of growth curve of % adult forearm length per d, 0-22 d of age; N=63 bats; Napa, CA
ai increase in body weight over time (to adult weight); N=20 bats; see paper for growth curves
aj body weight increase over time in males; N=9-18 bats; growth rate of females was not different from males; see citation for growth curves
ak respiration rate in dormant bats at 40 deg F; N=NR
al figure of breaths/minute over time; N=NR
am breathing rate of active animals at 25 C; N=NR; 50 mi. NE of Berkeley (capture location)
an breathing rate of resting animals at 25 C; N=NR; 50 mi. NE of Berkeley (capture location)
ao captive longevity record; N=NR
ap no values reported; see figures in paper; N=30; Condition=breeding; Napa Valley
aq estimated oxygen consumption of resting animals at 25 C; N=NR; animals captured at San Joaquin Experimental Range, CA
ar estimated oxygen consumption of animals with wings extended, at 25-27 C; N=NR; animals captured at San Joaquin Experimental Range, CA
as figure of metabolic heat production; N=NR; 50 mi. NE of Berkeley (capture location)
at figure of O₂ consumption at varying ambient temperatures; N=5 bats/group
au no values reported; see paper for figures; N=30; Napa Valley
av N=NR
aw N=NR
ax time of parturition through time when young begin to fly; N=NR; Camp Verde, Yavapai County
ay N=30; Condition=breeding; Napa Valley; pregnant females were captured in the field and gave birth in captivity
az date of first capture of a lactating female; N=39; Condition=breeding; Apr.-Jul.; John Day River Valley, 44deg 55' N, 120deg 27' W; lower spring temperatures correlated with lower number of reproducing females
ba N=NR

Exposure Factors for Pallid Bat (*Antrozous pallidus*)

Page 4

bb	N=NR
bc	N=NR
bd	period over which copulation occurs; N=1 male, 5 females
be	time of dispersal of summer roost colonies; N=NR
bf	juvenile dispersal; N=NR; Camp Verde, Yavapai County
bg	N=NR
bh	N=NR; peak molt observed in June and July
bi	end of winter dormancy period; N=NR

References

- 1 Brown, Patricia. 1976. Vocal communication in the pallid bat, *Antrozous pallidus*. *Z. Tierpsychol.* 41:34-54.
- 2 Davis, Russell. 1969. Growth and development of young pallid bats, *Antrozous pallidus*. *J. Mammal.* 50:729-736.
- 3 Beasley, Laura J., Kimberly M. Pelz and Irving Zucker. 1984. Circannual rhythms of body weight in pallid bats. *Am. J. Physiol.* 246(6):R955-R958.
- 4 Lewis, Susan E. 1993. Effect of climatic variation on reproduction by pallid bats (*Antrozous pallidus*). *Can. J. Zool.* 71:1429-1433.
- 5 Truett, Dennis R., and C.N. Slobodchikoff. 1976. Social effects of roosting on the metabolism of the pallid bat (*Antrozous pallidus*). *J. Mammal.* 57(4):656-663.
- 6 Orr, Robert T. 1954. Natural history of the pallid bat, *Antrozous pallidus* (LeConte). *Proc. Calif. Acad. Sci.* 28(4):165-246.
- 7 Hermanson, John W. and Thomas J. O'Shea. 1983. *Antrozous pallidus*. *Mamm. Species.* 213:1-8.
- 8 Bassett, John E. 1984. Litter size and postnatal growth rate in the pallid bat, *Antrozous pallidus*. *J. Mammal.* 65(2):317-319.
- 9 Barbour, R.W. and W.H. Davis. 1969. *Bats of America*. Lexington, KY: University of Kentucky Press. 285 p.
- 10 Bell, G.P. 1982. Behavioral and ecological aspects of gleaning by a desert insectivorous bat, *Antrozous pallidus* (Chiroptera: Vespertilionidae). *Behav. Ecol. Sociobiol.* 10(3):217-223.
- 11 Easterla, David A. and John O. Whitaker, Jr. 1972. Food habits of some bats from Big Bend National Park, Texas. *J. Mammal.* 53:887 - 890.
- 12 Whitaker, John O., Jr., Chris Maser, and Stephen P. Cross. 1981. Food habits of eastern Oregon bats, based on stomach and scat analysis. *Northwest Sci.* 55(4):.
- 13 Beasley, L.J. 1985. Seasonal cycles of pallid bats (*Antrozous pallidus*): proximate factors. *Myotis.* 23-24:115-123.
- 14 Chew, Robert M. and Harold E. White. 1960. Evaporative water losses of the pallid bat. *J. Mammal.* 41(4):452-58.
- 15 Licht, Paul, and Philip Leitner. 1967. Physiological responses to high environmental temperatures in three species of microchiropteran bats. *Comp. Biochem. Physiol.* 22:371-387.
- 16 Jones, Marvin L. 1982. Longevity of captive mammals. *Zool. Gart.* 52(2):113-128.
- 17 Beasley, Laura J. and Michael Leon. 1986. Metabolic strategies of pallid bats (*Antrozous pallidus*) during reproduction. *Physiol. Behav.* 36(1):159-166.
- 18 O'Shea, Thomas J. and Terry A. Vaughn. 1977. Nocturnal and seasonal activities of the pallid bat, *Antrozous pallidus*. *J. Mammal.* 58(3):269-284.

*Cal/EPA, OEHHA and the University of California Regents are not responsible for damages of any kind resulting from the use of or reliance on information in this report. Users are encouraged to consult the original data. Updated: February 1999.